MINISTRY OF FORESTS

As-Built Roads Submission Requirements

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1. SUBMISSION REQUIREMENTS

1.1 HISTORY

There is no requirement to maintain history. If a road section is submitted that already exists, and the submission meets acceptance criteria, all geometry and attributes from previous submissions will be replaced by the current submission

1.2 SPATIAL DATA

1.2.1 UNITS

The basic unit of interest is a road section. A road section:

- Has a single Point of Commencement (POC) and Point of Termination (POT)
- Is comprised of a collection of contiguous line segments that connect the PCO and POT

To illustrate this, note the accompanying diagram. Each line represents a road section and has a single POC and POT. Road sections may meet at those points, or may overlap each other. Junctions do not interrupt the integrity of the original section.

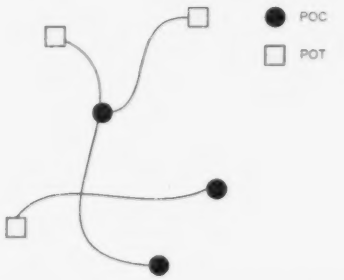

Figure 1 - Road representation example

Multiple road sections will be logically grouped, for the purpose of submission, with relation to the road permit (see: Spatial Data - Road Representation). In other words, each section must be associated with a valid road permit and a single road permit may be associated with multiple road sections.

1.2.2 ROAD REPRESENTATION

Each road section will be represented as a collection of non-disjoint, non-overlapping line segments with a single POC and POT (see General – Units). The accuracy requirement will be geo-referenced to 10 metres, as per Exhibit A standards.

The unique identifier for each road section must be a business key that can be validated against FTA. Valid business keys are:

Road Permits:	FOREST_FILE_ID, SECTION_ID
Forest Service Roads:	FOREST_FILE_ID, SECTION_ID
Special Use Permits:	FOREST_FILE_ID, SECTION_ID
Harvesting Licences (FLs, TFLs, WLs, etc.):	FOREST_FILE_ID, TIMBER_MARK, CUTBLOCK_ID. + a unique identifier for each road section on the block

1.2.3 EVENTS

Each road may have one or more events associated with it. Events are physical features that occur on or about the road such as bridges, culverts, etc. They will be represented as points or linear features and must be identified by the Business Key for the road section.

- Point features must provide location as either the distance in metres from the Point of Commencement (PoC) of the road, or a single coordinate.
- Linear Events must provide the location of the start and end of the event along the road, either by a pair of coordinates, or by a pair of distances from the POC.

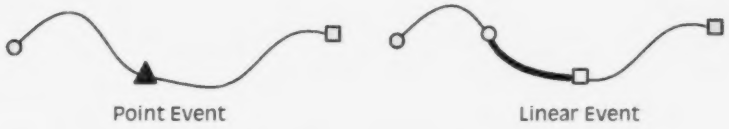

Figure 2 - Event representation examples

Note that if coordinates are supplied, a tolerance of +/- 10 metres will be enforced – i.e. events more than 10 metres from the road will generate errors.

1.3 SUBMISSION DETAILS

This section describes the data to be contained in a submission. It is organized by business type and, where applicable, is divided into three sub-categories:

- **Mandatory**. This data is compulsory and failure to supply it will result in a submission failure
- **Optional**. This data can be submitted by the user and will be processed, however failure to supply it will not compromise the submission
- **System Generated**. This data will be generated by the application itself and is not to be submitted by the user

Where possible, corresponding FRMA and LRDW references are provided. See the Integration Requirements section for further discussion of these systems.

1.3.1 SUBMISSION METADATA

This comprises information about the submission itself.

Mandatory Data

NAME	DESCRIPTION
Name	Name of the licensee representative to contact
Phone	Phone number of the licensee representative
Email	Email address of the licensee representative
Submission Date	Date of the submission.
Action	Insert/Update indicator
Client Code	Unique client identification
Client Location Code	Location identification

1.3.2 SPATIAL METADATA

This comprises information about the included spatial data. Only one set of metadata will accompany a submission. The fields presented here are representative of existing standards in place for other MSRM applications:

Mandatory Data

NAME	DESCRIPTION
Data Source	The source of the spatial data, e.g. Field Survey, Air Photos, etc.
Most Recent Source Date	Most recent collection date of the source data
Capture Method	The method used to capture the spatial data, e.g. Differential GPS, Tablet Digitizing, etc.
Observation Date	The data the observation was made.
Data Accuracy	The data accuracy percentile. Quantifies the percentage of features which are statistically expected to fall within the horizontal and vertical accuracy bounds. Ex: 95
Coordinate System *	The spatial coordinate system. Refer to the Code Tables appendix for a list of values.
Description	A description that can be used to clarify any of the values in the spatial meta-data.
CCSM Code	The TRIM CCSM code which best describes the feature. Ex: GA9100032
Horizontal Accuracy	The horizontal accuracy bound. Ex: 15
Vertical Accuracy	The vertical accuracy bound. Ex: 10
Horizontal Datum	The horizontal datum. Must be one of: Nad83, nad27.
Vertical Datum	The vertical datum. In British Columbia most vertical data uses the Canadian Vertical Datum. Ex: cvd28

1.3.2.1 NOTES ON COORDINATE SYSTEMS

The coordinate system attribute specifies the coordinate system used to represent the spatial features, e.g. WGS 84 / UTM zone 7N, WGS 84 / UTM zone 8N, etc. All content in a submission document must use the same coordinate system.

Note that ESF's implementation of GML currently restricts the format of coordinate data to decimal representation. Other formats such as degrees/ minutes/ seconds (DMS) are not supported.

1.3.3 ROAD TENURE

This identifies the road section that is being reported.

Mandatory Data

NAME	DESCRIPTION
ForestFileID	File identification assigned to Ministry of Forest files. Assigned file number. Usually the Licence, Permit Tenure or Private Mark number.
Road Section ID	Road Section Identifier For Road Permits, must match the identfier on the on the Exhibit A. For Cut Blocks, must be unique within the block

Optional Data

The following is required for permanent access roads within cut blocks. It is not required for roads built under RUP or SUP.

NAME	DESCRIPTION
Tiimber Mark	Timber Mark for the Cut Block containing the road section.
Cut Block Id	Identifier for a cut block of a harvesting tenure (within a cutting permit for tenures with cp's

1.3.4 BRIDGES

Mandatory Data

NAME	DESCRIPTION
To (m)	End point of bridge
From (m)	Start point of bridge
Superstructure ID No.	Unique Bridge ID Number
Site Id	ID for Crossing Location
Design Load Rating	Design Load Rating (tonnes)
Superstructure Type	Bridge Superstructure type. Refer to list of code values in Appendix B
Substructure Type	Refer to list of code values in Appendix B
Deck Type	Refer to list of code values in Appendix B

Optional Data

NAME	DESCRIPTION
Fish Present	Is this a fish values stream? Y or N.
Riparian Class	Riparian Classification. Refer to list of code values in Appendix B
Field KM Marker	Marker indicating the location along the route
Stream Name	Name of the body of water the bridge crosses
Current Load Rating	Current load rating in tonnes
Design Vehicle Code	Refer to list of code values in Appendix B
Next Inspection Date	Date of the next scheduled inspection
Bridge Deck Width	Deck width (0.01m)
Chronic Maintenance	Chronic maintenance? Y or N.
Upstream Risk	Is there risk to the structure from upstream? Y or N.
Inlet Risk	Is there risk to the inlet area of the structure? Y or N.
Adequate Size?	Is the structure of adequate size? Y or N.
Historic Washout	Historic washout? Y or N.

1.3.5 CULVERTS

Mandatory Data

NAME	DESCRIPTION
Metres from POC	Location of event along the route
Site/Structure Number	Unique MoF Structure Number
Diameter or Span (mm)	Dia. for Round / Width for others
Engineered Structure	Is this an Engineered structure (Major culvert)? Y or N.
Material Code	Material from which the culvert was made. Refer to list of code values in Appendix B
Design Load Rating	Design load rating n tonnes

Optional Data

NAME	DESCRIPTION
Fish Present	Is this a fish values stream? Y or N.
Riparian Class	Riparian Classification. Refer to list of code values in Appendix B
Height (mm)	Opening height. Mandatory if the culvert is not round.
Stream Name	Name of the body of water
Current Load Rating	Current load rating in tonnes
Design Vehicle Code	Refer to list of code values in Appendix B
Length	Length (mm along the stream)
Description	Description
Size OK	Is the structure of adequate size? Y or N.
Inlet Risk	Is there risk to the inlet area of the structure? Y or N.
Chronic Maintenance	Chronic maintenance? Y or N.
Comments	Comments
Site Number	ID for the crossing
Historic Washout	Historic washout? Y or N.

1.3.6 ENGINEERED STRUCTURES THAT ARE NOT STREAM CROSSINGS

Mandatory Data

NAME	DESCRIPTION
From (m)	From measure along the route
To (m)	To measure along the route
Type	The structure type code. Refer to list of code values in Appendix B
Engineered Structure	Is this an Engineered structure? Y or N.
Class	Acceptable values from licensees: WALL or FD

1.3.7 ORGANIC MATERIAL

Mandatory Data

NAME	DESCRIPTION
From (m)	From measure along the route
To (m)	To measure along the route
Organic Material Code	Describes how material was used. Refer to list of code values in Appendix B

Optional Data

None.

1.3.8 CONSTRUCTION DATE

Mandatory Data

NAME	DESCRIPTION
From (m)	From measure along the route
To (m)	To measure along the route
Activity Code	Type of Construction Activity. Refer to list of code values in Appendix B
Actual Completion Date	Date when event did occur

Optional Data

NAME	DESCRIPTION
Planned Activity	Is this a planned activity? Y or N. Default to 'N'
Season Code	Season constraints. Refer to list of code values in Appendix B
Outstanding Obligation	Are there any outstanding obligations? Y or N.
Inspection Planned	Has an inspection been planned? Y or N.
Comments	Comments

1.3.9 ACCESS CONTROL

Access control features (gates, berms, etc.) will be optional. If submitted, the following fields apply:

Mandatory Data

NAME	DESCRIPTION
Metres from POC (m)	Distance along the route from the POC in metres
Access Control Feature	Type of feature. Refer to list of code values in Appendix B

Optional Data

NAME	DESCRIPTION
Closure ID	An assigned structure ID code
Install Date	Install Date
Objective Code	The intent of the access control feature. Refer to list of code values in Appendix B
Vehicle Use	Intended vehicle access. Refer to list of code values in Appendix B

1.3.10 DEACTIVATION

Road Deactivation is Mandatory where applicable and can apply only to previously submitted roads.

Mandatory Data

NAME	DESCRIPTION
From (m)	From measure along the route
To (m)	To measure along the route
Deact Level	Deactivation list. Default to "DP". Refer to list of code values in Appendix B
Actual Completion Date	Date when event did occur

Optional Data

NAME	DESCRIPTION
Signage Date	The date that signage was installed
Reveg Date	The date Revegetation was done
Comments	General Comments for the event

2. FUNCTIONAL REQUIREMENTS

2.1 Submission Content

Submission may contain one or more road sections. A complete set of data for the road section must be submitted each time – i.e. all geometry, events, etc. Multiple road sections will be grouped by road permit.

2.2 Content Validation

Non-adherence to any of the rules described here will constitute a failure of the entire submission.

1. Road sections must be contiguous
2. Events must be placed within 10 metres of the road they are associated with

2.3 Validation Against External Systems

Non-adherence to any of the rules described here will constitute a failure of the entire submission.

1. The unique identifier for each road section must be a business key that can be validated against FTA. In other words, a submission may not be made unless a plan has been accepted and is available in that system.

   The business keys are:

Road Permits:	FOREST_FILE_ID, SECTION_ID
Forest Service Roads:	FOREST_FILE_ID, SECTION_ID
Special Use Permits:	FOREST_FILE_ID, SECTION_ID
Harvesting Licences (FLs, TFLs, WLs, etc.):	FOREST_FILE_ID, TIMBER_MARK, CUTBLOCK_ID. + a unique identifier for each road section on the block

   Note that SUP Roads and harvesting tenure roads are not maintained held in FTA, though the SUP and Harvesting tenures themselves are. Validation checks can thus only be done against these entities, not the road sections. Each road section id within these tenures must be unique within the SUP or cutblock, and can be an alphanumeric id up to 10 characters in length.

2. Ownership will also be validated – i.e. the submission client code must match that contained in FTA.

2.4 Update Procedures

Each submission for a road section must comprise a complete set of data about that entity. In other words, the entire road section must always be submitted, not just aspects of it

that have changed. Each submission then, will reflect the road section in its entirety, and will completely replace any previous submission as the most current version of the data.

Upon acceptance, a submission will automatically become the current version of the road section; if previous data exists it will be replaced.

2.4.1 Accuracy

Generally, spatial accuracy will be expected to +/- 10 metres. For some linear features however, increased accuracy will be required. These features are:

- Bridges
- Retaining walls
- French drains

The location of the start point for these features must be within 10 metres of its stated position and the linear feature length must be accurate to within +/- 0.5 metre.

2.4.2 Culverts

Only major/engineered and fish stream culverts are to be reported.

3. INTERFACE REQUIREMENTS

3.1 The Submission Document

A submission will be in the form of an XML document. For clients using integrated packages for forestry management, the packages will generate the submission in the correct format. Submission samples and templates are available in the submission guide at:
http://www.for.gov.bc.ca/his/esf/index_abr.htm .

3.2 Error Handling and Messaging

The user will be informed of immediate validation errors, i.e. deviations from the schema, interactively during the submission process. All other messages will be presented through the standard ESF mechanism. This involves a separate web page where the user can query the status of their submissions.

4. APPENDIX A - ROAD REGULATION

The minimum as-built data requirements are based on the following road regulation:

86 (1) In this section, "reporting period", in respect of the year in which the report referred to in subsection (2) is to be submitted, means the period extending from April 1 of the previous year to March 31 of that year.

(2) Before June 1 of each year, an agreement holder must submit to the district manager information respecting the following matters that occurred during the reporting period:

(a) for any road that is a permanent access structure that has been constructed, information respecting

(i) the location of the road,

(ii) the location, type and overall length of any bridges,

(iii) the location and the diameter or span of any major culverts and of any fish-stream culverts,

(iv) the stream crossing identifiers for bridges and culverts referred to in subparagraphs (ii) and (iii),

(v) the location of engineered structures other than bridges, culverts or fords, and

(vi) the location of road sections containing stumps, roots and embedded logs left or placed

(A) under the road fill within the road prism width, if the road is located on landslide prone terrain, or

(B) under the travelled portion of the road fill for other road locations;

(b) the location of any road that is a permanent access structure that has been deactivated;

5. APPENDIX B - CODE TABLES

Access Control

CODE	
BRREM	Bridge Removed
CULREM	Culvert Removed
BLDR	Boulders/Blocks
BERM	Berm
BLDER	Boulders/Blocks
GATE	Locked gate
RNGATE	Range Gate
SIGN	Sign
STRCT	Bridge/Culvert removed
TRAP	Tank Trap

Capture Method

CODE	
AP	Air Photo
CDMS	CDMS
FC1	Forest Cover Maps
SAT	Satelite
SUR	Survey
TRIM	TRIM
UNK	Unknown

CCSM

CODE	
DA25000120	Road (Gravel Undivided) 2 Lanes
DA25000160	Road (Gravel Undivided) U/C - 1 Lane
DA25000170	Road (Gravel Undivided) U/C - 2 Lanes
DA25000180	Road (Gravel Undivided) U/C - 3 Lanes
DA25050180	Road (Paved Divided) Not Elevated - 1 Lane Each Way
DA25050190	Road (Paved Divided) Not Elevated - 2 Lanes Each Way
DA25050200	(Paved Divided) Not Elevated - 3 Lanes Each Way
DA25050310	Road (Paved Divided) U/C - Not Elevated - 1 Lane Each Way
DA25050320	Road (Paved Divided) U/C - Not Elevated - 2 Lanes Each Way
DA25050330	Road (Paved Divided) U/C - Not Elevated - 3 Lanes Each Way
DA25100180	Road (Paved Undivided) Not Elevated - 1 Lane
DA25100190	Road (Paved Undivided) Not Elevated - 2 Lanes
DA25100200	Road (Paved Undivided) Not Elevated - 3 Lanes
DA25100210	Road (Paved Undivided) Not Elevated - 4 Lanes
DA25100220	Road (Paved Undivided) Not Elevated - More Than 4 Lanes
DA25100320	Road (Paved Undivided) U/C - Not Elevated - 1 Lane
DA25100330	Road (Paved Undivided) U/C - Not Elevated - 2 Lanes
DA25100340	Road (Paved Undivided) U/C - Not Elevated - 3 Lanes
DA25100350	Road (Paved Undivided) U/C - Not Elevated - 4 Lanes
DA25100360	Road (Paved Undivided) U/C - Not Elevated - More Than 4 Lanes
DA25150000	Road (Unimpr[illegible]ved)
DA25150100	Road.Over-grown
DA25150120	Road Loose.access Dry Weather
DD31700000	Trail
DD31700110	Trail POrtage
DD31700120	Trail Skid
JA08400000	Cut Line

Construction Activity

CODE	
NEW ROAD	New Road Construction
REACTIVATE	Road Reactivation
RELOCATE	Road Relocation
SURF	Surfacing
WIDEN	Road Widening

Coordinate System

CODE	
UTM	Universal Transverse Mercator
ALBERS	BC Albers
POLYCONIC	Polyconic
POLYCONIC1J	Polyconic 1J
LATLONG	Lat-Long
UNKNOWN	Unknown

Culvert Material

CODE	
CONC	Concrete
LOG	Log
MTL	CSP / CMP
OTH	Other

PLA	Plastic

Data Source

CODE	
photogrammetric	Photogrammetric
differentialGPS	Differential GPS
coordinateGeometryWithControl	Coord. Geometry With Control
orthoPhotography	Ortho Photo
monoRestitution	Mono Restitution
satelliteImagery	Satellite Imagery
tabletDigitizing	Tablet Digitizing
scanning	Scanning
sketchMap	Sketch Map
nondifferentialGPS	Nondiff. GPS
rubberSheeting	Rubber Sheeting
unknown	Unknown

Deck Type

CODE	
C	Concrete
CC	Concrete Composite
G	Gravel
S	Steel
TT	Timber - Treated
TU	Timber - Untreated

Design Vehicle

CODE	
L100	Off Highway (L100)
L150	Off Highway (L150)
L165	Off Highway (L165)
L45	Old On Highway (L45)
L60	Old On Highway (L60)
L75	On Highway (L75)
OTHER	Other

Deactivation Level

CODE	
DP	Permanent
DS	Semi-Permanent
DT	Temporary

Engineered Structures Class

CODE	
WALL	Wall
FD	French Drain

Engineered Structures Type for Class = FD

CODE	
EP	Embedded pipe
RF	Rock Fill

Engineered Structures Type for Class = WALL

CODE	
BLOCKS	Lock blocks
EARTHFILL	Earth fill
LOG CRIB	Log crib
OTH	Other retaining wall
REIN CONC	Reinforced concrete
STEEL BIN	Steel Binwall
STEEL PIPE	Steel pipe

Horizontal Datum

CODE	
NAD83	North American Datum 1983
NAD27	North American Datum 1927
OTHER	Other datum

Objective

CODE	
DR	Damage to Road
EP	Environmental Protection
FH	Fire Hazard
LC	Livestock Control
US	User Safety
WP	Wildlife Protection

Organic Material

CODE	
ORGANIC - PRISM	Stumps, roots, logs under traveled portion of road
ORGANIC - TRAVL	Stumps, roots, logs in road fill

Riparian Class

CODE	
L1	Lake: riparian class L1
L2	Lake: riparian class L2
L3	Lake: riparian class L3
L4	Lake: riparian class L4
S1	Stream: riparian class S1
S2	Stream: riparian class S2 x
S3	Stream: riparian class S3
S4	Stream: riparian class S4
S5	Stream: riparian class S5
S6	Stream: riparian class S6
UC	Unclassified waterbody requiring id & Mgt
W1	Wetland: riparian class W1
W2	Wetland: riparian class W2
W3	Wetland: riparian class W3
W4	Wetland: riparian class W4
W5	Wetland: riparian class W5

Road Type

CODE	
CP	Cutting Permit Road
FSR	Forest Service Road
RP	Road Permit Road

Season

CODE	
AN	Any Season
FA	Fall
SP	Spring
SU	Summer
WI	Winter
DF	Dry or Frozen Soils
FW	Fish Windows
TS	Time Sensitive

Superstructure Type

CODE	
CONCRETE	Concrete
GLULAM	Glulam
STEEL	Steel
LOG	Log Stringers
TU	Timber – Untreated Stringers
TT	Timber – Treated Stringers

Substructure Type

CODE	
BIN	Binwall
CB	Concrete Block
CIP	Concrete Cast in Place
CP	Concrete Precast
CRIB	Crib log or Timber
O	Other
PP	Pile -Permanent Materials
PT	Pile - Temporary Materials
SP	Sill - Permanent Materials
SPP	Steel Pipe and Pre-cast Pat
ST	Sill -Temporary Materials

Vehicle Use

CODE	
2WD	2 Wheel Drive
4WD	4 Wheel Drive
ATV	All Terrain Vehicles
FOOT	Foot/Bike/Hike
NONE	No Access

Vertical Datum

CODE	
CVD28	Canadian Vertical Datum 1928
NAV88	North American Vertical Datum 1988
OTHER	Other Datum